FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

FIPA Request Interaction Protocol Specification

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1 FIPA Request Interaction Protocol

The FIPA Request Interaction Protocol (IP) simply allows one agent to request another to perform some action. ~~and the receiving agent to perform the action or reply, in some way, that it cannot.~~ The representation of this protocol is given in *Figure 1* which is based on extensions to UML 1.x.AUML [Odell2001]. This protocol is identified by the token fipa-request as the value of the protocol parameter of the ACL message.

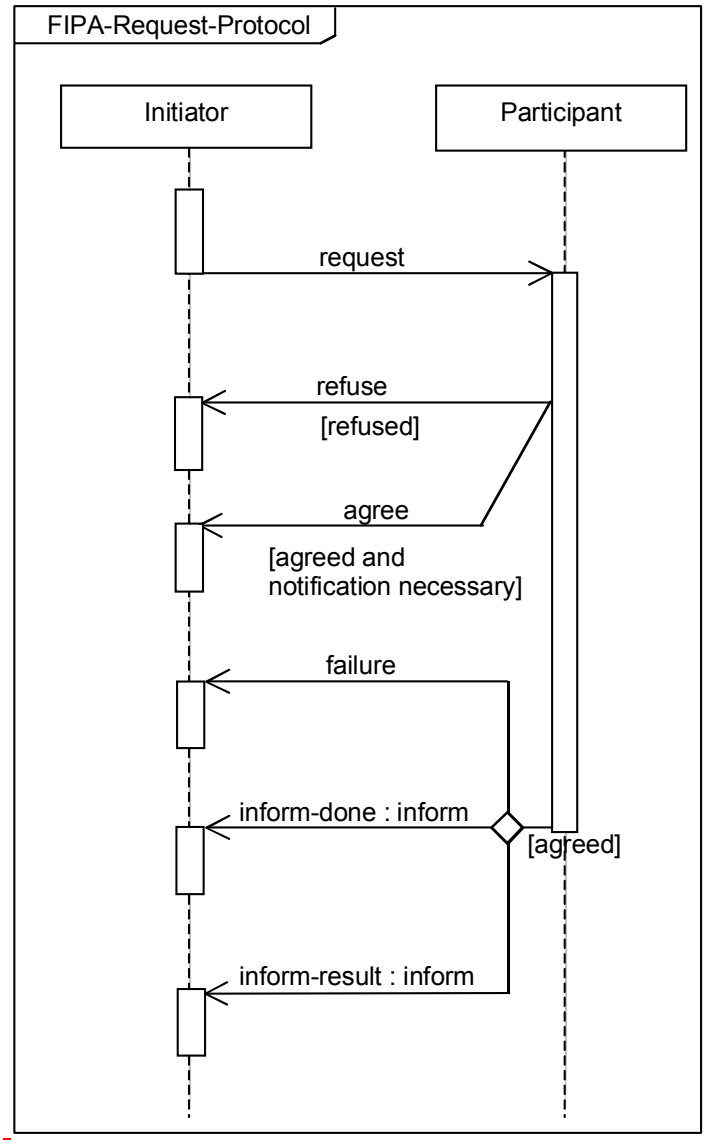

Figure 1: FIPA Request Interaction Protocol

1.1 Explanation of the Protocol Flow

The FIPA Request Interaction Protocol (IP) allows one agent to request another to perform some action. The Participant processes the request and makes a decision whether to accept or refuse the request. If a refuse decision is made, then "refused" becomes true and the Participant communicates a `refuse`. Otherwise, "agreed" becomes true. If conditions indicate that an explicit agreement is required (i.e., "notification necessary" is true), then the Participant communicates an `agree`. The `agree` may be optional depending on circumstances, e.g., if the requested action is very quick, and can happen before a `:reply-by` time from the request is reached. Once the request has been agreed upon, then the Participant must communicate either (1) a `failure` if it fails in its attempt to fill the request; (2) an `inform-done` if it successfully completes the request and only wishes to indicate that it is done; or (3)

an `inform-result` if it wishes to indicate both that it is done and notify the initiator of the results. ~~(A better explanation here)~~

Any interaction using this interaction protocol is identified by a globally unique, non-null `conversation-id`, assigned by the Initiator. The agents involved in the interaction must tag all of its ACL messages with this conversation identifier. This enables each agent to manage its communication strategies and activities, e.g., it allows an agent to identify individual conversations and to reason across historical records of conversations.

1.2 Exceptions to Protocol Flow

At *any* point in the IP, the receiver of a communication can inform the sender that it did not understand what was communicated. This is accomplished by returning a `not-understood` communication. As such, the figure above does not depict a `not-understood` communication as it can occur after any communication. The communication of a `not-understood` within an interaction protocol may terminate the entire IP. Termination of the interaction may imply that any commitments made during the interaction are null and void.

At any point in the IP, the initiator of the IP may cancel the interaction protocol by initiating the meta-protocol shown in *Figure 2*. The conversation-id of the cancel interaction is identical to the conversation-id of the interaction that the Initiator intends to cancel. The semantics of the cancel should roughly be interpreted as meaning that the initiator is no longer interested in continuing the interaction, and that it should be terminated in a manner acceptable to both the Initiator and the Participant. The Participant either informs the Initiator that the interaction is done using an `inform-done`, or indicates the failure of the cancellation using a `failure`.

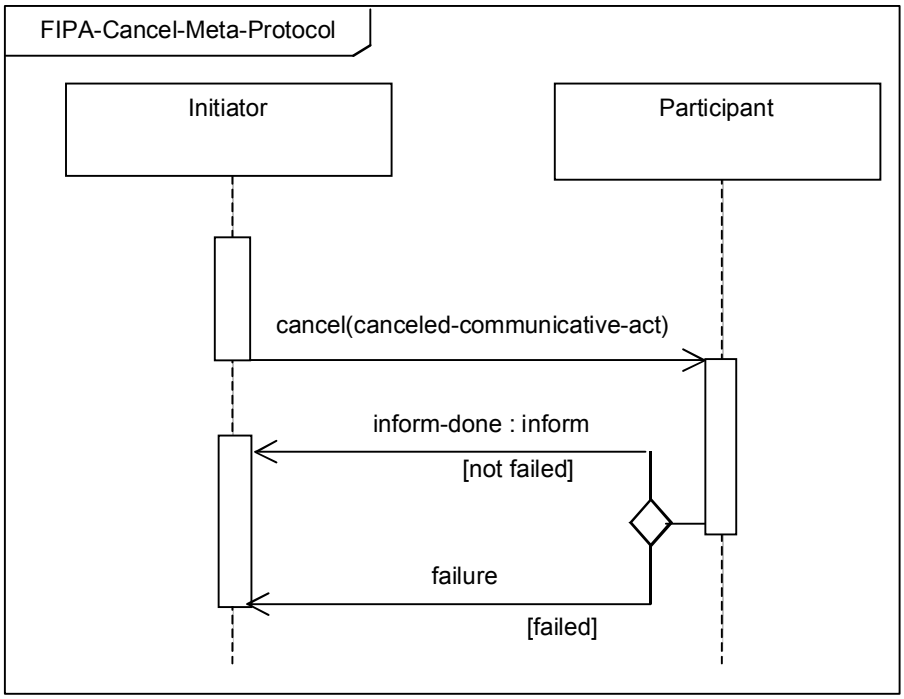

Figure 2: FIPA cancel meta-protocol

This IP is a pattern for a simple interaction type. Elaboration on this pattern will almost certainly be necessary in order to specify all cases that might occur in an actual agent interaction. Real world issues such as the effects of cancelling actions, asynchrony, abnormal or unexpected IP termination, nested IPs, and the like, are explicitly not addressed here.

~~"""The communication of a `not-understood` within an interaction protocol terminates the IP. Furthermore, tThis protocol is a pattern for a simple interaction type. Elaboration on this pattern will almost certainly be necessary in order to specify all cases that might occur in an actual agent interaction. Real world issues of cancelling actions, asynchrony, abnormal or unexpected protocol termination, nested protocols, and the like, are explicitly not addressed here.~~

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105 # 2 References

106 [Odell2001] Odell, James, H. Van Dyke Parunak, and Bernhard Bauer, "Representing Agent Interaction Protocols
107 in UML," *Agent-Oriented Software Engineering*, Paolo Ciancarini and Michael Wooldridge ed.,
108 Springer, Berlin, 2001, pp. 121-140. http://www.fipa.org/docs/input/f-in-00077.

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~~2~~3 Informative Annex A — ChangeLog

~~2.1~~3.1 2002/05/10 - version G by FIPA Architecture Board

Page 1,Figure 1: The communication labeled «inform-ref» was changed to «inform-result» for clarity. The purpose of this communication is to inform the initiator of a results. Inform-result implies inform-done.

Page 1, Figure 1 : The «not-understood» communication was removed

Page 1, Figure 1 : Reworked the protocol flow to make the « agree » optional. This also involved changing the exclusive-or with the agree to a different AUML notation.

Page 1, Figure 1 : To conform to UML 2, the protocol name was placed in a boundary, « x » is removed from the diamonds (xor is now the default), and the template box was removed.

Page 1, line 50 : Added a new section 1.1 entitled « Explanation of the Protocol Flow »

Page 1, line 50 : Renumbered old section 1.1 to section 1.2. Added a paragraph explaining the not-understood communication and its relationship with the IP.

Page 1, line 42 : Removed some of the explanation, it was superseded by the explanation in Section 1.2.

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